CHEMISTRY (CHEM)

CHEM 101 — GENERAL CHEMISTRY I LABORATORY
1 credit.

Chemistry 101 is the laboratory only part of "Chemistry 103: General Chemistry I". CHEM 101 is intended only for students who have earned college credit prior to entering UW-Madison for a course that is equivalent to the lecture part of Chemistry 103, but not the laboratory part. Students need this lab experience or its equivalent before proceeding to Chemistry 104: General Chemistry II, the second semester of the General Chemistry sequence. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 102 — GENERAL CHEMISTRY II LABORATORY
1 credit.

Chemistry 102 is the laboratory only part of Chemistry 104: General Chemistry II. CHEM 102 is intended for students who have earned college credit prior to entering UW-Madison for a course that is equivalent to the lecture part of Chemistry 104, but not the laboratory part. Students need this lab experience or its equivalent to proceed to any intermediate level chemistry courses such as Organic Chemistry (341 or 343), Analytical Chemistry (327 or 329), and Inorganic Chemistry (311). Enroll Info: None
Requisites: Consent of instructor
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 103 — GENERAL CHEMISTRY I
4 credits.

Introduction. Stoichiometry and the mole concept, the behavior of gases, liquids and solids, thermochemistry, electronic structure of atoms and chemical bonding, descriptive chemistry of selected elements and compounds, intermolecular forces. For students taking one year or more of college chemistry; serves as a prereq for CHEM 104; lecture, lab and discussion. Enroll Info: None
Requisites: Suitable math placement score or completion of MATH 112, MATH 114, MATH 171 or equivalent; not open to students who have taken CHEM 109 or 115
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 104 — GENERAL CHEMISTRY II
5 credits.

Principles and application of chemical equilibrium, coordination chemistry, oxidation-reduction and electrochemistry, kinetics, nuclear chemistry, introduction to organic chemistry. Lecture, lab, and discussion. Enroll Info: None
Requisites: CHEM 103 and MATH 112, 114, or 171; not open to students who have taken CHEM 109 or 115
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 105 — GENERAL CHEMISTRY I
3 credits.

Stoichiometry and the mole concept, chemical reactions, thermochemistry, electronic structure of atoms, periodic properties, chemical bonding, intermolecular forces, and the behavior of gases, liquids and solids. First semester of a two-semester sequence for students taking one year or more of college chemistry; includes lecture and discussion. CHEM 105 is not open for general enrollment. The course provides a mechanism for awarding credit for experiences with no laboratory component, such as credit by examination. The combination of CHEM 101 and CHEM 105 is equivalent to CHEM 103. Enroll Info: None
Requisites: MATH 112, 114, or 171 or placement into MATH 211 or 221. Not open to students with credit for CHEM 103, 109, or 115
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2019

CHEM 106 — GENERAL CHEMISTRY II
4 credits.

Principles and applications of chemical equilibrium, electrochemistry, thermodynamics, kinetics, organic chemistry and other topics that may include nuclear chemistry, biological chemistry and coordination chemistry. Second semester of a two-semester sequence for students taking one year or more of college chemistry; includes lecture and discussion. CHEM 106 is not open for general enrollment. The course provides a mechanism for awarding credit for experiences with no laboratory component, such as credit by examination. The combination of CHEM 102 and CHEM 106 is equivalent to CHEM 104. Enroll Info: None
Requisites: CHEM 103 or (CHEM 101 and CHEM 105) and (MATH 112, 114, or 171 or placement into MATH 211 or 221). Not open to students with credit for CHEM 104, 109 or 115
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 108 — CHEMISTRY IN OUR WORLD
5 credits.

Chemistry 108 is a one-semester introductory course that includes selected topics in inorganic and organic chemistry. Emphasis is on relevance to biological, environmental and social issues. Chemistry 108 is not intended for students who expect to take additional chemistry courses and it does not satisfy any prerequisites for further chemistry courses. Enroll Info: Appropriate for students needing only one semester of chemistry. No HS chemistry required. 1 year HS chemistry is permitted. Open to first year students. Enrollment not permitted for students who have completed CHEM 104, 109 or 115
Requisites: Not open to students who have taken CHEM 104, CHEM 109, or CHEM 115
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 109 — ADVANCED GENERAL CHEMISTRY
5 credits.

A modern introduction to chemical principles that draws on current research themes. For students with good chemistry and mathematics background preparation who desire a one-semester coverage of general chemistry. Recommended for students intending majors in chemistry or allied fields. Lecture, lab, and discussion. Enroll Info: At least 1 year HS chemistry; placement into MATH 221 or higher or equivalent math proficiency. Open to first year students. Enrollment not permitted for those who have completed CHEM 104 or 115
Requisites: MATH 113, 114, or 171; not open to students who have taken CHEM 104 or CHEM 115
Course Designation: Gen Ed - Quantitative Reasoning Part B
Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 115 — CHEMICAL PRINCIPLES I
5 credits.

For specially well qualified students majoring in chemistry or chemical engineering. Lecture, lab, and quiz. Enroll Info: Adv placement or adv HS chem, cr or con reg in MATH 221 or cons inst. Open to Fr
Requisites: CHEM 115 Student Group Required
Course Designation: Gen Ed - Quantitative Reasoning Part B
Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 116 — CHEMICAL PRINCIPLES II
5 credits.

Continuation of Chemistry 115. Chemistry 115 and 116 satisfy the requirements for general chemistry and introductory analytical chemistry; lecture, lab, and discussion. Enroll Info: CHEM 115 or cons inst. Open to Fr
Requisites: CHEM 116 Student Group Required
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 155 — STUDY ABROAD IN INTRODUCTORY CHEMISTRY
1-6 credits.

Provides equivalency for study abroad courses in introductory chemistry that do not equate to existing UW-Madison chemistry courses. Enroll Info: None
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No

CHEM 260 — ENTERING RESEARCH I
1 credit.

Seminar course designed primarily for sophomores or transfer students to begin independent research in chemistry. Taken concurrently with 1-3 research credits with faculty member. Supports independent research experience. Enroll Info: None
Requisites: None
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 261 — ENTERING RESEARCH II
1 credit.

Seminar course for primarily sophomores or transfer students continuing independent research in chemistry. Taken concurrently with 1-3 research credits with faculty member. Supports independent research experience. Enroll Info: Must have taken CHEM 260, or completed at least one semester of research with a faculty member.
Requisites: None
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2016

CHEM 299 — DIRECTED STUDY
1-4 credits.

Enroll Info: None
Requisites: Consent of instructor
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 311 — CHEMISTRY ACROSS THE PERIODIC TABLE
4 credits.

Explores the properties, reactions and uses of elements and compounds, with emphasis on coordination chemistry of transition-metal ions, bioinorganic chemistry, solid-state structure and main-group elements. The weekly three-hour laboratory introduces students to the synthesis and characterization of inorganic compounds.. Enroll Info: CHEM 109 or 104. Open to Freshmen
Requisites: CHEM 104, CHEM 109, or CHEM 116
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 327 — FUNDAMENTALS OF ANALYTICAL SCIENCE
4 credits.

Fundamentals of chemical measurement in chemistry, biology, engineering, geology, and the medical sciences. Topics include equilibria of complex systems, spectroscopy, electrochemistry, separations, and quantitative laboratory technique. Lecture, lab, and discussion. Enroll Info: None
Requisites: CHEM 104 or CHEM 109
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 329 — FUNDAMENTALS OF ANALYTICAL SCIENCE
4 credits.

Fundamentals of chemical measurement in chemistry, biology, engineering, geology, and the medical sciences. Topics include equilibria of complex systems, spectroscopy, electrochemistry, separations, and quantitative laboratory technique. For chemistry majors, chemical engineering majors, and related majors. Lecture, lab, and discussion. Enroll Info: None
Requisites: CHEM 104 or CHEM 109
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 341 — ELEMENTARY ORGANIC CHEMISTRY
3 credits.

Chemistry 341 is a single semester, terminal course covering selected topics in organic chemistry. Chemistry 341 is not equivalent to either Chemistry 343 or 345 and it does not satisfy the prerequisite for enrollment in Chemistry 345. Enroll Info: None
Requisites: CHEM 104, CHEM 109, or CHEM 116; not open to students who have taken CHEM 343 or CHEM 345
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 342 — ELEMENTARY ORGANIC CHEMISTRY LABORATORY
1 credit.

Chemistry 342 introduces organic laboratory techniques in synthesis, purification and spectral interpretation. The course is designed to accompany Chemistry 341 and topics closely follow Chemistry 341. Enroll Info: Completion of or concurrent enrollment in CHEM 341. For students who expect to take only one semester of organic chemistry and need only a single laboratory credit. Enrollment not permitted for students who have completed CHEM 344
Requisites: CHEM 341 or concurrent enrollment; not open to students who have completed CHEM 344
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 343 — INTRODUCTORY ORGANIC CHEMISTRY
3 credits.

Chemistry 343 covers fundamental aspects of organic molecular structure, including stereochemistry, and introduces basic themes in organic reactivity. It is the first semester of a two-semester organic chemistry sequence. Chemistry 345 is the second course in the sequence. Class is for students expecting to take two semesters of organic chemistry. Enroll Info: None
Requisites: CHEM 104, 109, or 116
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 344 — INTRODUCTORY ORGANIC CHEMISTRY LABORATORY
2 credits.

Chemistry 344 introduces the basic synthesis, purification, and characterization techniques of organic chemistry, along with critical interpretation of experimental data. The laboratory includes material from both Chemistry 343 and 345. Enroll Info: None
Requisites: Completion of or concurrent enrollment in CHEM 345. May not repeat CHEM 344 if previously earned credit for CHEM 344
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 345 — INTERMEDIATE ORGANIC CHEMISTRY
3 credits.

Chemistry 345 is the second course of a two-semester sequence in organic chemistry. It covers diverse themes in organic reactivity, building on a foundation provided in Chemistry 343. Chemistry 341 does not satisfy the prerequisite for 345. Enroll Info: None
Requisites: Grade of C or better in CHEM 343
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 346 — INTERMEDIATE ORGANIC CHEMISTRY LABORATORY
1-2 credits.

Multi-step synthetic processes. Advanced experimental techniques such as high-vacuum distillation. Independent research projects. Enroll Info: None
Requisites: CHEM 344 and 345
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 350 — COMMUNICATING CHEMISTRY TO THE PUBLIC VIA DEMONSTRATIONS
2 credits.

Through this course, students will gain experience in the safe and proper presentation of chemical demonstrations. They will join an experienced staff who enjoy doing demonstrations and who continue to develop the art of presenting them; students will learn from each other as well as staff and faculty from science departments, music, theater and other performing artists who combine their art with scientific experiments to share the joy and excitement of both artistic and scientific creativity. Public presentations will be offered both on and off campus to a wide variety of audiences (students, teachers, parents and the community at large) in a variety of settings (school settings and public venues). Enroll Info: None
Requisites: CHEM 103, 108 or 109
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2017

CHEM 355 — STUDY ABROAD IN INTERMEDIATE CHEMISTRY
1-6 credits.

Provides equivalency for study abroad courses in intermediate chemistry that do not equate to existing UW-Madison chemistry courses. Enroll Info: None
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No

CHEM 375 — INTERMEDIATE TOPICS IN CHEMISTRY
1-4 credits.

Various topics in chemistry at the intermediate level; intended for undergraduates. Offerings will require that students have completed a college level general chemistry course as a minimum. Additional requirements may apply depending on the topic. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM/M S & E 421 — POLYMERIC MATERIALS
3 credits.

Polymer chemistry and physics terminologies, structure-property relationship, polymer characterization, polymer synthesis, material requirements for optoelectronics including conjugated polymers, thin film transistors, light emitting diodes, non-linear optical materials, holographic data storage and liquid crystal polymers. Enroll Info: None
Requisites: CHEM 341, 343, or member of Engineering Guest Students
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM/CBE 505 — ASPECTS OF INDUSTRIAL CHEMISTRY AND BUSINESS FUNDAMENTALS
3 credits.

The objective of this course is to educate students in the chemistry and chemical engineering that defines societies' standard of living. Commercial chemical processes will be reviewed. Practical realities of how a discovery moves from research to commercial product will be taught through examples and case studies. Financial concepts that guide investment will be reviewed. Enroll Info: Junior standing and CHEM 345
Requisites: CHEM 345 and junior standing or higher
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 509 — SENIOR SEMINAR
2 credits.

Senior Seminar provides an integrative experience that requires students to synthesize the knowledge and skills that have been introduced across the Chemistry curriculum. Through a series of seminars by faculty and advanced graduate students, specific research challenges will be identified. Groups of students will be formed and assigned the task of using the chemical literature to identify routes to the solutions of these problems, presenting their findings both in class presentations and written assignments. Enroll Info: CHEM 561 or CHEM 565; completion of or concurrent enrollment in CHEM 563
Requisites: None
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2019

CHEM 511 — ADVANCED INORGANIC CHEMISTRY
3 credits.

Emphasizes the symmetry, structure and bonding of inorganic compounds. Selected topics may include applications in transition metal chemistry, organometallic chemistry, industrial catalysis, advanced bioinorganic chemistry, solid-state chemistry or main group chemistry. Students majoring or intending to major in chemistry should take CHEM 311 prior to taking CHEM 511. Enroll Info: None
Requisites: Students must have junior standing AND have taken or be concurrently enrolled in CHEM 345.
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 524 — CHEMICAL INSTRUMENTATION
3 credits.

Instrumental methods of measurements, as applied to modern chemical analysis; lecture and lab. Enroll Info: None
Requisites: CHEM 343, (CHEM 329 or 327), and PHYSICS (208 or 202)
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 547 — ADVANCED ORGANIC CHEMISTRY
3 credits.

A third semester of descriptive organic chemistry. Enroll Info: CHEM 345
Requisites: CHEM 345
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 555 — STUDY ABROAD IN ADVANCED CHEMISTRY
1-6 credits.

Provides equivalency for study abroad courses in advanced chemistry that do not equate to existing UW-Madison chemistry courses. Enroll Info: None
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No

CHEM 561 — PHYSICAL CHEMISTRY
3 credits.

Macroscopic theory: equilibrium thermodynamics, chemical kinetics and transport properties. Enroll Info: CHEM 327 or 329; MATH 222; PHYSICS 201 or 207. Not for credit for those who have taken CHEM 565
Requisites: (CHEM 327 or CHEM 329), MATH 222, and (PHYSICS 201 or PHYSICS 207)
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 562 — PHYSICAL CHEMISTRY
3 credits.

Molecular theory: quantum chemistry, molecular structure and spectra, statistical mechanics, selected topics in the molecular theory of matter in bulk. Enroll Info: CHEM 561 or 565 or ChE 211; PHYSICS 202 or 208
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Accelerated Honors (!)
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 563 — PHYSICAL CHEMISTRY LABORATORY
1-2 credits.

Principles of experimental physical chemistry applied to the acquisition of thermodynamic and kinetic data; use of basic physical laboratory equipment; related computations, analysis of errors, interpretation of results. Enroll Info: CHEM 561 or 565 or Ch E 211
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, for 2 number of completions
Last Taught: Spring 2021

CHEM 564 — PHYSICAL CHEMISTRY LABORATORY
1 credit.

Principles of experimental physical chemistry applied to the acquisition and interpretation of basic data on molecular structure and dynamics, and properties of macromolecules; principles and use of spectroscopic and other electronic instrumentation. Enroll Info: CHEM 562 and 563. Not for cr for those who have taken 567
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 565 — BIOPHYSICAL CHEMISTRY
4 credits.

Equilibrium thermodynamics, chemical kinetics, and transport properties, with emphasis on solution behavior and applications to biological macromolecules in solution. For students interested primarily in the biological applications of physical chemistry. Enroll Info: CHEM 327 or 329; MATH 222; PHYSICS 201 or 207; Biocore 303, or BIOCHEM 501 or concurrent registration, or consent of instructor. Not for credit for those who have taken CHEM 561
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 575 — ADVANCED TOPICS IN CHEMISTRY
1-4 credits.

Various topics in chemistry intended for advanced undergraduates. Students enrolling in this course will be required to have completed at least a college level general chemistry course and some 300 level chemistry course work. Additional requirements may apply depending on the topic. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 605 — SPECTROCHEMICAL MEASUREMENTS
3 credits.

Mass spectrometry and applied nuclear magnetic resonance. Two lecture sessions, or lectures, and one problem session per week. Enroll Info: CHEM 562 or cons inst
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 606 — PHYSICAL METHODS FOR STRUCTURE DETERMINATION
1-3 credits.

A survey of spectroscopic methods for inorganic structure determination. This course will introduce the major non-crystallographic techniques with an emphasis on the application to structural analysis. The basic theory and methodology of each form of spectroscopy will be presented. Topics covered include: ligand field theory, electronic absorption, Raman, Mossbauer and EPR stectroscopies, and magnetic susceptibility. Enroll Info: CHEM 511 562 or cons inst. CHEM 608 or equiv recommended
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 607 — LABORATORY SAFETY
1 credit.

Aspects of laboratory safety relating to chemical, electrical, optical, mechanical, cryogenic and radiological hazards will be discussed. Safety equipment, techniques (including first aid), and facilities will be introduced. Enroll Info: CHEM 346 or cons inst
Requisites: None
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 608 — SYMMETRY, BONDING, AND MOLECULAR SHAPES
1-3 credits.

This course provides a solid background in elementary bonding theory and its application to understanding molecular geometry and reactivity. The course emphasizes qualitative methods applied to the bonding of elements from throughout the periodic table. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 613 — CHEMICAL CRYSTALLOGRAPHY
3 credits.

Theory of structural chemistry, experimental methods involved, applications to problems of chemical interest; use of diffractometric equipment and computer data analysis for an actual structure determination. Enroll Info: CHEM 562 or cons inst
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 621 — INSTRUMENTAL ANALYSIS
3-4 credits.

Chemical instrumentation, spectrochemical, electrochemical and other methods of instrumental analysis; lecture and lab. Enroll Info: Cr or con reg in CHEM 561 or cons inst
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 622 — ORGANIC ANALYSIS
2 credits.

Biological Mass Spectrometry: Fundamentals and Applications. Enroll Info: CHEM 345 524 or consent of instructor
Requisites: CHEM 345 and CHEM 524; or graduate standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2019

CHEM 623 — EXPERIMENTAL SPECTROSCOPY
2-3 credits.

The theory behind current spectroscopic methods employed in chemical analysis with applications in atomic and molecular absorption spectroscopy, infrared and Raman vibrational spectroscopy, flourescence and light scattering; lecture and laboratory projects. Enroll Info: CHEM 562 or consent of instructor
Requisites: CHEM 562 or graduate standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 624 — ELECTROCHEMISTRY
2-3 credits.

Theory of interfacial electron transfer and mass transport processes in electrochemistry, with applications to electroanalysis, electrodeposition and electrochemical separations; lecture and laboratory projects. Enroll Info: None
Requisites: Graduate Students Only
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 625 — SEPARATIONS IN CHEMICAL ANALYSIS
2-3 credits.

Fundamentals of transport processes and the origins of chemical potential differences giving rise to separation. Principles of chromatography, electrophoresis and field flow fractionation. Lecture and laboratory projects. Enroll Info: 1 sem organic 1 sem phys chem, or cons inst
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM/GENETICS 626 — GENOMIC SCIENCE
2 credits.

This course is designed to bring cutting-edge topics in the genomic sciences into the reach of traditionally "pure" chemistry, biology, engineering, computer science statistics students. It is also designed for enabling biologically-oriented students to deal with the advances in analytical science so that they may incorporate new genomic science concepts into their own scientific repertoires. Intended for graduate students and for undergraduates with extensive research experience. Enroll Info: None
Requisites: Graduate Students Only
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM/BMOLCHEM 627 — METHODS AND TECHNOLOGIES FOR PROTEIN CHARACTERIZATION
2-3 credits.

Seeks to engage students interested in chemical instrumentation and those who desire to apply proteomic technologies to current biological problems. Understanding the current proteomics landscape, the limitations of these technologies, and their practical applications are among the course learning objectives. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2015

CHEM 628 — CHEMICAL INSTRUMENTATION: DESIGN AND CONTROL APPLICATIONS
3 credits.

The design and application of chemical instrumentation; basic principles for monitoring and controlling chemical experiments; optical, electrical and mechanical sensors and transducers of importance to analytical chemical instrumentation; lecture and lab. Enroll Info: CHEM 524, 621 or consent of instructor
Requisites: Prerequisites are CHEM 524 or 621 or graduate student standing.
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 629 — ATMOSPHERIC CHEMICAL MECHANISMS
3 credits.

Focuses on the chemical mechanisms and kinetics of reactive gases and aerosol in Earth's atmosphere. Fundamental concepts from analytical, physical, and organic chemistry will be used as tools to describe atmospheric processes occurring in both the troposphere and the stratosphere. Specific topics include: Evolution and chemical composition of Earth's atmosphere; applications of the steady-state approximation; residence and renewal time; sources, transformation, transport and deposition of trace gases in the troposphere; air pollution control strategies; stratospheric chemistry.
Requisites: CBE 310 or concurrent enrollment in CHEM 561 or 565; or graduate/professional standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2019

CHEM 630 — SELECTED TOPICS IN ANALYTICAL CHEMISTRY
1-3 credits.

Lectures of a specialized nature in advanced analytical chemistry. Enroll Info: CHEM 524, 621 or cons inst
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 635 — TOPICS IN COMPUTATIONAL CHEMISTRY
1 credit.

This course is designed to give students a basic understanding of computational chemistry, which can be implemented within students' research. In addition, this course will discuss new techniques and developments in the literature, and specific types of calculations that are relevant to current students' research and needs. Enroll Info: None
Requisites: Graduate Students Only
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 636 — TOPICS IN CHEMICAL INSTRUMENTATION: INTRODUCTION TO NMR
2 credits.

This course will instruct students on the theory and practice of NMR spectroscopy. It is a full semester course, consisting of 15 hours of lecture and 30 hours laboratory instruction. Enroll Info: Enrollment will be limited based on available instrumentation for lab exercises
Requisites: None
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 637 — TOPICS IN CHEMICAL INSTRUMENTATION: ADVANCED METHODS IN NMR
1-2 credits.

This course will instruct students on advanced methods of NMR spectroscopy. It is offered as a seven week module, consisting of 7 hours of lecture, 14 hours of laboratory instruction, 1 hour final exam. Enroll Info: Enrollment will be limited based on available instrumentation for lab exercises
Requisites: None
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Summer 2017

CHEM 641 — ADVANCED ORGANIC CHEMISTRY
3 credits.

Topics in physical organic chemistry. Enroll Info: CHEM 345 or cons inst
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 652 — CHEMISTRY OF INORGANIC MATERIALS
3 credits.

Graduate level course on the materials chemistry of inorganic solids. Focuses on the application of chemical concepts to an understanding of properties of solids and how these properties are manifested in practical applications. Enroll Info: Graduate student standing or CHEM 562 or equivalent
Requisites: CHEM 562 or graduate standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2019

CHEM 653 — CHEMISTRY OF NANOSCALE MATERIALS
3 credits.

Introduction to solid state materials chemistry, with an emphasis on contemporary topics in the chemistry of nanomaterials. Incorporates fundamental knowledge of solid-state chemistry and traditional materials chemistry with current nanoscale and nanostructural materials research. Enroll Info: Graduate student standing or both CHEM 311 and CHEM 561 or equivalent
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 654 — MATERIALS CHEMISTRY OF POLYMERS
2-3 credits.

Polymer classification, synthesis, and molecular architecture; solid state structure and characterization; glassy state and glass transition; polymer rheology in solids and gels; transport, dielectric and optical properties. Enroll Info: CHEM 562 or cons inst
Requisites: None
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 661 — CHEMICAL AND STATISTICAL THERMODYNAMICS
3 credits.

Basic chemical thermodynamics with applications to chemical and phase equilibria and the study of solutions; introduction to statistical mechanics and calculation of thermodynamic quantities from molecular models; stability and fluctuations. Enroll Info: CHEM 561 or 565, CHEM 562; or consent of instructor
Requisites: CHEM 562 or graduate standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 664 — PHYSICAL CHEMISTRY OF MACROMOLECULES
2-3 credits.

Structure, thermodynamics, and dynamics of polymers in solution and in the bulk; theoretical models and experimental methods; polymer characterization. Enroll Info: CHEM 562 or consent of instructor
Requisites: CHEM 562 or graduate standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2019

CHEM/BIOCHEM 665 — BIOPHYSICAL CHEMISTRY
4 credits.

Equilibrium thermodynamics, chemical kinetics and transport properties, with emphasis on solution behavior and application to noncovalent interactions of biological macromolecules in solution. For graduate students interested in the biological applications of physical chemistry. Enroll Info: Grad st or cons inst. Stdts must meet prereqs for CHEM 565 have some prev background in phys chem
Requisites: Graduate standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 668 — BIOPHYSICAL SPECTROSCOPY
2-3 credits.

Focuses on the underlying principles and applications of spectroscopic and microscopy methods employed to solve biological problems at the atomic and molecular level. Techniques covered in this class include electronic absorption and fluorescence spectroscopy, circular dichroism, light scattering, fluorescence microscopy, multidimensional nuclear magnetic resonance and electron spin resonance. Enroll Info: CHEM 561 or equivalent. CHEM 562 or equivalent recommended
Requisites: None
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2019

CHEM 675 — INTRODUCTORY QUANTUM CHEMISTRY
3 credits.

Basic principles of quantum chemistry, exactly solvable problems, angular momentum, approximation methods, applications to electronic structure. Enroll Info: CHEM 562 or consent of instructor
Requisites: CHEM 562 or graduate standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 681 — SENIOR HONORS THESIS
2-4 credits.

An independent and original study done under the direction of a member of the staff, recommended for seniors majoring in chemistry. CHEM 681 and CHEM 682 are taken in consecutive semesters. Students must enroll for a total of exactly 6 credits between the two courses, taking either 3 credits each semester or 2 credits one semester and 4 credits the other. Enroll Info: Honors candidacy
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Honors Only Courses (H)
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 682 — SENIOR HONORS THESIS
2-4 credits.

Continuation of 681. Students must enroll for a total of exactly 6 credits between CHEM 681 and 682, taking either 3 credits each semester or 2 credits one semester and 4 credits the other. Enroll Info: Honors candidacy
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Honors Only Courses (H)
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 691 — SENIOR THESIS
2-6 credits.

An independent and original study done under the direction of a member of the staff, recommended for seniors majoring in chemistry. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 692 — SENIOR THESIS
2-6 credits.

Continuation of 691 Enroll Info: None
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2019

CHEM 699 — DIRECTED STUDY
1-6 credits.

Enroll Info: Jr or Sr st. Graded on a lettered basis; requires cons inst
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM/BIOCHEM 704 — CHEMICAL BIOLOGY
3 credits.

Chemistry and biology of proteins, nucleic acids and carbohydrates; application of organic chemistry to problems in cell biology, biotechnology, and biomedicine. Enroll Info: None
Requisites: Declared in Biochemistry or Chemistry graduate program
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 713 — INORGANIC AND ORGANOMETALLIC CHEMISTRY OF THE MAIN GROUP ELEMENTS
1-3 credits.

A modular course consisting of 1), inorganic and 2), organometallic chemistry of main-group elements and 3), organosilicon chemistry. Enroll Info: CHEM 511 or equivalent
Requisites: Graduate standing or CHEM 511
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 714 — ORGANOMETALLIC CHEMISTRY OF THE TRANSITION ELEMENTS
2-3 credits.

Enroll Info: CHEM 511 or consent of instructor
Requisites: Graduate standing or CHEM 511
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 738 — INTRODUCTION TO MASS SPECTROMETRY
1 credit.

Introduction to the theory and practice of mass spectrometry. Topics include gas chromatography/mass spectrometry (GCMS), electrospray ionization (ESI), matrix assisted laser-desorption ionization (MALDI), liquid chromatography/mass spectrometry (LCMS), imaging mass spectrometry, and ion mobility mass spectrometry. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM/B M E/MED PHYS 750 — BIOLOGICAL OPTICAL MICROSCOPY
3 credits.

Covers several aspects of state-of-the-art biological and biophysical imaging with an emphasis on instrumentation, beginning with an overview of geometrical optics and optical and fluorescence microscopy. The bulk of the course will focus on advanced imaging techniques including nonlinear optical processes (multi-photon excitation, second harmonic generation, and stimulated Raman processes) and emerging super-resolution methods. Special emphasis will be given to current imaging literature and experimental design. Enroll Info: Knowledge of physics-based optics [such as PHYSICS 202] strongly recommended.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 758 — CHEMISTRY EDUCATION RESEARCH
2 credits.

An introduction to chemistry education research and the theories that underpin it. Models of learning will be developed and refined throughout the semester on the basis of primary literature discussed in-class. How theories of cognition could and should inform learning objectives and assessments in college chemistry learning environments will be explored. Substantial emphasis will be placed on critically reading and analyzing studies in the chemistry education research literature with an eye toward the implicit and explicit theories of cognition informing the work. No prior experience with coursework in the learning sciences is assumed. Appropriate for students engaged in discipline-based education research as part of a graduate degree, those interested in pursuing academic careers, and those broadly interested in scholarship related to teaching and learning. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 762 — MOLECULAR REACTION DYNAMICS
2-3 credits.

Microscopic approach to chemical dynamics. Enroll Info: CHEM 562 or cons inst
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2015

CHEM 763 — INTRODUCTION TO MOLECULAR SPECTROSCOPY
2-3 credits.

Quantum mechanics of molecular rotation and vibration; principles of group theory; electronic, vibrational, and magnetic resonance spectroscopy in gas and condensed phases. Enroll Info: CHEM 675 or cons inst
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2015

CHEM/PHM SCI 766 — MOLECULAR RECOGNITION
2-3 credits.

Origin, nature, classification, and description of intermolecular forces. The hydrophobic effect. Molecular complexes, binding constants, and their measurements. General principles of self-assembly, molecular recognition, complex formation, host design. Supramolecular systems and their dynamics. Micelles, bilayers, vesicles, biological membranes. Enroll Info: None
Requisites: CHEM 561
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 775 — ELECTRONIC STRUCTURE OF MOLECULES
2-3 credits.

Applications of quantum mechanics to the electronic structure and properties of molecules. Enroll Info: CHEM 675 or cons inst
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 777 — PHYSICAL CHEMISTRY OF SURFACES
2-3 credits.

Structure, thermodynamics, kinetics, and reactivity of molecules at the interfaces between gases, liquids and solids, with applications to catalysis, atmospheric chemistry, monolayers, and thin films. Enroll Info: CHEM 562 or cons inst
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 801 — SELECTED TOPICS IN INORGANIC CHEMISTRY
1-3 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 841 — ADVANCED ORGANIC CHEMISTRY
3 credits.

Synthesis of simple and complex organic compounds. Enroll Info: CHEM 641
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 842 — ADVANCED ORGANIC CHEMISTRY
1-3 credits.

Selected topics. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2016

CHEM 843 — ADVANCED ORGANIC CHEMISTRY
1-3 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

CHEM 845 — MACROMOLECULAR CHEMICAL BIOLOGY
2 credits.

Critically read, analyze and discuss the primary literature in chemical biology by focusing on topics associated with macromolecules (largely proteins and nucleic acids). Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

CHEM 860 — SELECTED TOPICS IN PHYSICAL CHEMISTRY
1-3 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 864 — STATISTICAL MECHANICS
2-3 credits.

Fundamentals of statistical mechanics; applications to equilibrium and non-equilibrium properties of gases and condensed phases; selected advanced topics. Enroll Info: CHEM 661 675 or cons inst
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2018

CHEM/BIOCHEM 872 — SELECTED TOPICS IN MACROMOLECULAR AND BIOPHYSICAL CHEMISTRY
1-3 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 890 — HIGHLIGHTS AT THE CHEMISTRY-BIOLOGY INTERFACE
1 credit.

Includes oral presentations by students reporting their current thesis research at the chemistry-biology interface and discussions of reproducibility, rigor, and the responsible conduct of research. Intended for graduate student trainees in the UW-Madison NIH Chemistry-Biology Interface Training Program. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 900 — SEMINAR-INORGANIC CHEMISTRY
0 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 901 — SEMINAR-TEACHING OF CHEMISTRY
0-1 credits.

The role of the teaching assistant in undergraduate chemistry instruction. Effective utilization of instructional aids. Innovations for better teaching. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 915 — SEMINAR-STRUCTURE AND BONDING IN INORGANIC COMPOUNDS
0-1 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2016

CHEM/BIOCHEM 918 — SINGLE MOLECULE APPROACHES TO BIOLOGY
1 credit.

A combination of recent literature and original research presentations relating to the use of single molecule techniques in biochemistry including fluorescence microscopy, tethered particle motion, patch-clamping, cryo-electron microscopy, optical trapping, magnetic tweezers, and super resolution microscopy. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 920 — SEMINAR-ANALYTICAL CHEMISTRY
0 credits.

Prepared seminar covering diverse advanced topics. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 923 — GENOMIC SCIENCES PROGRAM SEMINAR
1 credit.

The Genomic Sciences Training Program (GSTP) seminar course brings together trainees, faculty trainers, and other interested faculty and students for cross-disciplinary exposure to cutting edge research in genomic sciences. Seminars are presented by trainees and other scientists who study genomics using approaches based in chemistry, computer science, biostatistics, engineering and biological and biomedical sciences. Research objectives, findings and future directions are discussed. Required for trainees in the Genomic Sciences Training Program. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

CHEM 940 — SEMINAR-ORGANIC CHEMISTRY
0 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 941 — SEMINAR-SYNTHETIC ORGANIC CHEMISTRY
0-1 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2016

CHEM 942 — SEMINAR-PHYSICAL ORGANIC CHEMISTRY
0-1 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2016

CHEM 943 — SEMINAR-BIO-ORGANIC CHEMISTRY
0-1 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2016

CHEM/BIOCHEM 945 — SEMINAR-CHEMICAL BIOLOGY (ADVANCED)
1 credit.

Recent published research in chemical biology and related areas. Intended for advanced graduate students, and required of all NIH Chemistry-Biology Interface trainees. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 960 — SEMINAR-PHYSICAL CHEMISTRY
0-2 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 964 — SEMINAR: MOLECULAR DYNAMICS
0-1 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 990 — RESEARCH-ORGANIC
1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 991 — RESEARCH GENERAL
1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 992 — RESEARCH-PHYSICAL
1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 993 — RESEARCH-ANALYTICAL
1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 994 — RESEARCH-INORGANIC
1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

CHEM 995 — RESEARCH-MACROMOLECULAR CHEMISTRY
1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2018

CHEM 996 — RESEARCH-MATERIALS CHEMISTRY
1-12 credits.

Graduate thesis research in materials chemistry. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

CHEM 998 — RESEARCH-CHEMICAL BIOLOGY
1-12 credits.

Graduate thesis research in Chemical Biology. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021